**Technical Report 1204**

# Expertise as Effective Strategy Use: Testing the Adaptive Strategies Model in the Ill-Structured Domain of Leadership

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**August 2007**

**United States Army Research Institute**
**for the Behavioral and Social Sciences**

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14, ABSTRACT *(Maximum 200 words)*:

This research tested the Adaptive Strategies Model (ASM; Lemaire & Siegler, 1995) of expertise in the ill-defined domain of leadership. More specifically, we examined expert/novice differences in all components of the ASM: strategy existence, strategy choice, strategy base-rate, and strategy execution. In Experiment 1 Leadership Scenarios elicited free-text responses from undergraduates (novices), ROTC Cadets (intermediates), and US Army Platoon Leaders (experts). Each response was coded into one of ten underlying Leadership Strategies thought to underlie each response, resulting in patterns of individual strategy use. Experiment 2 used a new group of experts to gather ratings of the execution accuracy of responses from Experiment 1. The results show that the ASM is able to discern expert/novice differences in strategy choice, strategy base-rate, and strategy execution. As leaders progress from novice to expert, they a) use multiple strategies across various scenarios, b) develop the ability to make optimal choices about when and where to use particular strategies, c) develop an increased sensitivity to each different strategy's base rate of success in the environment, and d) develop the ability to execute strategies more accurately. The training of ill-defined skills, such as leadership, may be improved by focusing on the four components of ASM.

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EXPERTISE AS EFFECTIVE STRATEGY USE: TESTING THE ADAPTIVE STRATEGIES MODEL IN THE ILL-STRUCTURED DOMAIN OF LEADERSHIP


## EXECUTIVE SUMMARY

Research Requirement:

The primary objectives of this research are to test a theoretical model of expertise in complex tacit knowledge domains like leadership and test a diagnosis and training approach that is based on that theoretical model of expertise. The theoretical model being applied to leadership assumes that one important component of expertise is the effective and appropriate use of strategies. Expert strategy use generally differs from novice strategy use along five dimensions (Lemaire & Siegler, 1995; Schunn & Reder, 1998). In order to provide appropriate training to a novice, one has to diagnose the particular type of strategy use problems exhibited by the given novice. The particular problems include (a) missing strategies entirely, (b) under-using generally effective strategies, (c) poorly executing strategies, and (d) executing good strategies at the wrong times, (e) failing to adapt strategies to a changing environment.

Diagnosing strategy use in complex domains like leadership presents a difficult challenge. Thus, the secondary objectives of this research are to explore mechanisms for automatically diagnosing strategy use and larger scale problems in patterns of strategy use (along the five described dimensions) in complex domains, particularly the strategies found in written responses. If such a method can be developed, then this strategies-training approach can be effectively applied in distributed, distance-training situations.

This research tested the Adaptive Strategies Model (ASM; Lemaire & Siegler, 1995) of expertise in the ill-defined domain of leadership. More specifically, we examined expert/novice differences in all 4 components of the ASM: strategy existence, strategy choice, strategy base-rate, and strategy execution.

Procedure:

In Experiment 1 Leadership Scenarios elicited free-text responses from undergraduates (novices), ROTC Cadets (intermediates), and US Army Platoon Leaders (experts). Each response was coded into one of ten underlying Leadership Strategies thought to underlie each response, resulting in patterns of individual strategy use. Experiment 2 used a new group of experts to gather ratings of the execution accuracy of responses from Experiment 1.

Findings:

The results show that the ASM is able to discern expert/novice differences in strategy choice, strategy base-rate, and strategy execution. As leaders progress from novice to expert, they a) use multiple strategies across various scenarios, b) develop the ability to make optimal choices about when and where to use particular strategies, c) develop an increased sensitivity to

each different strategy's base-rate of success in the environment, and d) develop the ability to execute strategies more accurately.

Utilization and Dissemination of Findings:

This research elaborates on the understanding of how people adapt their strategy use to changing environments. There appears to be stable individual differences in how well people adapt their strategy selections to changing environments. Based on this research, a puzzle emerges for what underlies this strategy adaptivity. Strategy adaptivity has both implicit and explicit components and it is the explicit component that is required for rapid adaptivity. However, it was found that working memory capacity and memory interference factors, which were expected to influence adaptivity, do in fact not influence adaptivity. The training of ill-defined skills, such as leadership, may be improved by focusing on the four components of the Adaptive Strategy Model.

EXPERTISE AS EFFECTIVE STRATEGY USE: TESTING THE ADAPTIVE STRATEGIES MODEL IN THE ILL-STRUCTURED DOMAIN OF LEADERSHIP

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# Introduction

## Expertise as Effective Strategy Use

Society has always been fascinated by experts, those individuals who consistently outperform their peers. Scientific research examining the nature of expertise has produced a variety of general models of expert behavior. For example, the *Biologically-determined* model, typically associated with the work of Galton (1869/1979), holds that expertise differences are the reflection of inherited faculties, and that training and practice are a necessary but insufficient means of obtaining expert abilities. Under this view, experts are born not made. Alternatively, the *Ecological-constraints* model states that expertise is largely determined by constraints in the environment that focus attention on the most relevant features of the domain (Gibson, 1991). Here, anyone who spends enough time working within a domain will acquire expertise. Similarly, the *Feature-recognition* model predicts differences in expert's ability to discern meaningful patterns within the domain, as is evident in chess-masters superior ability to recall the pieces that they see in a rapid presentation (Chase & Simon, 1973; Chi, Glaser, & Farr, 1988). Another view, the *Representational-differences* model, states that expert performance is driven by experts' deeper, more principled problem representations within their domain of expertise, as is evident when expert physicists sort problems by their underlying principles (e.g., mechanics, Newton's laws) while novices sort the same problems based on surface features (e.g., inclined plane, stacked blocks; Chi, 1981). While all of these models are empirically supported, the predictive ability of each model depends on the nature or structure of the domains and tasks within which the models are applied. In general, these models have been more thoroughly tested, in well-structured or well-defined domains than ill-structured domains that are more relevant to real-world applications.

The structure of a domain or task will also dictate what general procedures or *strategies* individuals use to solve problems within a domain. Because most problems can usually be solved by using many different strategies, individuals tend to vary in the strategies that they use (Reder, 1987; Siegler, 1996). Hence, another model of expertise, the *Strategies* model, examines the different strategies people use within domains and predicts individual differences in the strategies used by experts and novices. The Strategies model has been validated in many domains, from very simple to very complex (*see* Siegler, 1996 for a review).

An important variation on this basic Strategies model holds that there is more variation in expert/novice strategy use than just *which* strategies are used. This expanded strategies model, commonly referred to as the *Adaptive Strategies Model* (ASM), was developed by Lemaire and Siegler (1995) and predicts that experts will vary from novices on four related but different dimensions of strategy use: *Existence*, *Choice*, *Base-rate*, and *Execution*, each of which is described below.

The *Strategy Existence* dimension predicts that experts' strategy repertoire will include better strategies than novices' (Lee & Anderson, 2001; Logan, 1992; Schraagen, 1993; Schunn & Anderson, 1997; Voss, Tyler, & Yengo, 1983). For example, studies of learning addition found that older children (experts) use a retrieval strategy and younger children (novices) rely on a

calculate strategy (Siegler, 1988), and expert air traffic controllers are more likely to use a workload management strategy than novice air traffic controllers (Seamster, Redding, Cannon, & Ryder, 1993).

The *Strategy Choice* dimension posits that experts will know which strategy is best for a given problem more often than novices (Schunn, Reder, Nhouyvanisvong, Richards, & Stroffolino, 1997; Siegler & Lemaire, 1997). For example, in serial recall tasks, older children (experts) were found to choose (use) a repeated rehearsal strategy more often than younger children (novices) who also knew the strategy and would have benefited from choosing to use the rehearsal strategy (McGilly & Siegler, 1990). As another example, expert military teams may be better able to judge when to use implicit versus explicit modes of coordination when adapting to a new situation (Entin & Serfaty, 1999).

The *Strategy Base-rate* dimension predicts that experts will use the strategies that are most frequently effective more often than novices (Lovett & Anderson, 1996; Lovett & Schunn, 1999; Schunn & Reder, 2001). For example, in a simple problem solving task, Lovett and Anderson (1996) found that novices learned that one strategy was generally more appropriate than other with experience and began to select that strategy overall more often.

The *Strategy Execution* dimension predicts that when experts and novices use the same strategy, the experts will use common or shared strategies faster and more accurately than novices (Delaney, Reder, Staszewski, & Ritter, 1998; Lee & Anderson, 2001; Lovett & Anderson, 1996; Rickard, 1997). For example, Delaney et al. (1998) found that students became faster at executing mental addition algorithms through repeated practice, even for problems not see before (and thus not available to the retrieval strategy).

These separate dimensions of the ASM have been validated in a variety of domains, the majority of which have been primarily well-defined or well-structured (e.g., physics, spelling, multiplication, addition, simulated air traffic control). Similarly, research testing the combined effects of the ASM's four dimensions of strategy use has tended to focus on well-defined domains and tasks (e.g., calculator use vs. mental addition). As such, we understand considerably less about strategy expertise and its development within ill-defined or ill-structured domains and tasks such as politics or leadership. It may be that behavior and learning does not cohere well at the level of strategies for ill-defined domains, and thus the use of the strategies lens might be inappropriate overall. Components of the model might break down in an ill-structured domain. For example, if representations change significantly, a completely different set of strategies might apply, and thus we would mainly see differences in which strategies were used rather than how they were used.

The goal of the current research was to test for expert/novice differences in all four components of the Adaptive Strategies Model in an ill-defined domain. We chose the ill-defined domain of *Leadership* – in particular, platoon leadership within the US Army – for reasons elaborated below.

Leadership is a prime example of an ill-defined domain. Leadership has been described as one of the most observed and least understood phenomena on earth, and there are practically

as many definitions of leadership as there are persons who have attempted to define the concept (Stogdill, 1981). For the purpose of this research, we defined leadership as the process of interpersonal influence in which direct and indirect means are employed to get others to accomplish the organization's goals, where influence is achieved by providing purpose, direction, and motivation (Horvath, Forsythe, Bullis, Sweeney, Williams, McNally, Wattendorf, & Sternberg, 1999).

This definition is the definition utilized by the US Army, who has one of the most comprehensive leadership-training programs in the world (Horvath et al., 1999). The US Army's comprehensive leadership-training program makes them a good choice for the study of an ill-defined construct like leadership for several reasons. The US Army has a systematic leadership-training program that standardizes (to the extent that it is possible) what is generally expected of Army leaders while explicitly suggesting how those expectations can be achieved by Officers. The resulting code of leadership skills and behaviors is formalized through leadership training that includes standardized: leadership coursework, fieldwork, curriculum and instruction, field manuals, and assessment tools. These standardized instructional materials facilitate the training and assessment of individuals' leadership abilities – an otherwise extremely difficult task. Furthermore, since promotion through the hierarchical ranks of the Army is highly selective and dependent upon demonstrated leadership ability, the identification of what the Army considers an expert leader is highly associated with rank. All of these characteristics make the ill-defined construct of leadership relatively more defined within the US Army, though the concept is still ill-defined in terms of standard scientific measures. That is, while there may be consensus on general types of leadership behavior, even experienced US Army Generals often disagree on the exact details of what the correct behavior might be for a given situation – the answer will still depend somewhat on the given situation, leader, and followers.

There are also many levels of leadership within the US Army (from commanding 10 to commanding 100,000), each of which demands different skills and behaviors. Hence, this research focused on the platoon level of leadership because it is the most direct level of leadership (Horvath et al., 1999). Direct-level leadership is characterized by face-to-face interactions with small groups (20 to 40 individuals), in contrast to middle-level (organizational) or high-level (strategic) leadership (e.g., Battalion, Division, Corps) where the group sizes are in the hundreds to thousands of individuals, and the amount of leader-follower interaction is quite small (Hunt, 1991). Furthermore, in terms of civilian leadership research, there have been significantly more studies focused on direct leadership than middle or high-level leadership, and thus direct leadership behavior is more thoroughly understood (Hunt, 1991).

The goal of the current paper is to test whether the Adaptive Strategies Model describes expert/novice differences in platoon leadership tasks, and more specifically, whether there are expert/novice differences in all 4 components of the ASM: strategy *existence*, strategy *choice*, strategy *base-rates*, and strategy *execution*. Alternatively, it may be the case that leadership behavior is too complex to be reduced to simple sets of procedures or strategies. Perhaps the overall conduct of effective leaders does not fit into any coherent and/or consistent patterns of behavior. For example, individual differences across multiple personality traits are often cited as significant factors in determining effective leadership (Stogdill, 1981). Certainly many other factors, such as representational ability, pattern recognition, situational awareness, and

interpersonal style (to name a few), impact an individual's leadership ability. However, while all of these factors likely underlie and influence an individual's leadership decision-making processes – the end result is a calculated response to a problem – an action or description of behavior that can be framed in terms of using one or more sets of procedures or strategies.

We present two separate but linked experiments examining expert-novice differences across the four components of the ASM. In Experiment 1 we examine the *Existence*, *Choice*, and *Base-Rate* components; in Experiment 2 we examine the *Execution* component.

## EXPERIMENT 1: TESTS OF STRATEGY EXISTENCE, CHOICE, AND BASE-RATE

The primary goal of Experiment 1 was to examine group differences in strategy *Existence*, *Choice*, and *Base-Rate*. We developed 50 *Leadership Scenarios* – situations that a Platoon Leader is likely to encounter in the field. We used these scenarios to collect open-ended, free-text *Responses* from 3 different groups – *Novices*, *Intermediates*, and *Expert*s. We then coded these responses into categories of general *Leadership Strategies*. Once the responses were coded into their underlying strategies, we analyzed the different patterns of strategy usage in the three groups.

### Method

Participants

*Expert*s. 66 US Army Lieutenants and Captains from two Army bases participated voluntarily (mean age = 25.8 years, 49 males, 60 with Bachelors and 6 with Masters). All experts had commanded a platoon within the last 5 years. Note that we use the term expert in a relative sense in comparison to the Intermediates and Novices. Some of these participants still have additional content to learn about platoon leadership, and some of the captains may already have forgotten some elements of platoon leadership.

*Intermediates.* 23 undergraduates (mean age = 19.7 years, 17 males) enrolled in the Reserve Officer Training Corps (ROTC) program at George Mason University (GMU) were recruited through the ROTC office at GMU. Intermediates received payment for their participation at a rate of $10/hr.

*Novices.* 39 undergraduates (mean age = 19.1 years, 23 males), from the University of Pittsburgh with no military experience participated for course credit.

Materials

*Leadership Scenarios.* Leadership Scenarios represented situations that a Platoon Leader is likely to encounter in everyday practice. They are not tactical battle scenarios requiring multilayered, elaborate responses. Instead they are more local problem-solving scenarios that typically require a single (well chosen) response. Fifty Leadership Scenarios were developed using two US Army resources. First, 15 scenarios were taken directly from the Tacit Knowledge for Military Leaders: Platoon Leader Questionnaire (TKML: PLQ), a recently developed military leadership assessment tool. Second, the head of the GMU ROTC program helped researchers adapt another 35 scenarios taken from the Army Leadership Tacit Knowledge Corpus (ALTKC),

a collection of Army leaders' self-reported leadership experiences. The resulting 50 scenarios cover the main competencies commonly associated with platoon leadership (Horvath et al, 1999; *Table 1*).

| Platoon Leader Competency | Number of Scenarios |
|---|---|
| Teaching and Counseling | 10 |
| Soldier Team Development | 11 |
| Supervision | 9 |
| Communication | 8 |
| Planning | 4 |
| Decision-making | 4 |
| Use of Available Systems | 4 |

*Table 1.* Platoon Leader Competencies and Number of Related Leadership Scenarios

Each scenario was designed to require the use of a single strategy, rather than a combination of different strategies within one response. Note that the scenarios contained no military acronyms or other components that might make the scenarios impenetrable to the non-experts. Table 2 presents one typical scenario. Appendix A provides a sample scenario for each competency.

**Scenario-4**. Your platoon is going to be deployed for a very long period of time. One of your Soldiers requests to stay behind to be with a child who has a life-threatening illness. His position is integral to the mission. How do you respond to his request?

*Table 2.* A Sample Leadership Scenario (Competency: Teaching and Counseling)

To make the amount of work required of the participants manageable, the 50 scenarios were divided into five subsets of ten scenarios each (subsets were balanced for competency type), and each participant generated free-text responses to one set (10 responses). Set and scenario order within set were randomly assigned. The scenarios were presented one per page, with considerable space for a response. Each response was assumed to reflect the instantiation of a particular leadership strategy, and these responses were the primary source of data for this research.

*Leadership Strategies***.** Strategy categories were developed to reflect the general kinds of responses that one could, in theory, apply across a wide range of situations, but were also specific enough to reflect the core intent of particular responses. Because the leadership literature is heavily focused on personality and social psychology levels of analysis, and very general

styles of leadership, such as transactional versus transformational leadership, we developed our own categorization scheme.

Leadership Strategies were developed by two raters performing a card sort on a corpus of responses (between 5 and 10 responses per problem) to the 15 problems in the TKML: PLQ. This card sort produced 14 initial categories or strategies. After a preliminary coding of additional responses, it became clear that coders were consistently confusing certain strategies. An analysis of a confusability matrix of coders' disagreements identified overlapping strategies, which were then combined, resulting in ten distinct strategies. The head of the GMU ROTC program also helped to clarify these strategy definitions. The ten Leadership Strategies and brief descriptions are listed in Table 3, and their full definitions are included as Appendix B. Note that the definitions of these leadership strategies are quite general, and could be applied to other areas of leadership.

| Strategy | Brief Description |
| --- | --- |
| Authoritative | Give direct commands without justification. |
| Avoidance | No immediate action; assume the situation will resolve itself. |
| Influencing | Convince or persuade others of your point of view. |
| Planned-Action | Careful, deliberate, and rational planning of actions. |
| Proactive | Do not wait for instruction, act on anticipation of solutions. |
| Professional-Development | Focus on personal development and self-management while maintaining military bearing, give feedback to improve performance, solicit Soldiers' opinions and suggestions. |
| Punishing | Immediately threaten punitive actions. |
| Reinforcement | Actively seek advice from others (superiors, peers, friends, etc.). |
| Seek-Information | Seek added information about the current situation. |
| Supportive | Show compassion or empathy for Soldiers' perspective, provide appropriate rewards and recognition. |

*Table 3.* Leadership Strategies and Brief Descriptions (see Appendix B for full definitions).

Additional coding proved more reliable, and showed that these ten strategies were sufficiently distinct to discern differences in the free-text responses. For example, Table 4 shows three different responses to the same scenario and each response is an example of a different strategy.

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**Scenario-37** (Competency: Communication):
At National Training Center (NTC), your platoon has just completed a night move and you have been in position for two hours. A weapon is identified as missing around midnight. You know that the weapon is in this position because it was seen during the previous sensitive item check conducted as part of position improvement. Another sensitive item report is due at 0400. How do you handle this situation?

**PROACTIVE Response (Expert):**

*"Immediately, I will take the platoon and sweep the position for the missing weapon. I would also conduct hourly sensitive items checks hourly until 0400 hours."*

**AUTHORITATIVE Response (Intermediate):**

*"Find the weapon, have a PCI of all sensitive items around the area, check everyone, until it was found. Nobody would go anywhere or go to sleep until it was found."*

**PLANNED-ACTION Response (Novice):**

*"I would go get the weapon and go look for it. I would alert the other officers what I was doing and I would go find that weapon if I knew where it was. After all I was just sitting around for 2 hours being useless so I might as well do something. Then I would get some members of my team to go ahead and start working on the sensitive time report so it could be ready in time. If it weren't ready I'd tell them that I was looking for the weapon."*

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*Table 4.* One Scenario and Three Sample Response Strategies

*Ideal Response Strategies.* The assessment of the individual dimensions of the ASM depends on a valid measure of the correctness of answers to our scenarios (at the strategy level). Measures of strategy *existence*, *choice*, and *base-rate* all rely, to varying degrees, on comparisons related to the overall pattern of correct responses to our 50 scenarios. However, ill-defined domains and problems, such as leadership, do not come with logically correct answers like most math or science problems. Moreover, no answer is perfect, and different answers vary on a continuum of how well they solve particular problems. However, for any particular ill-defined problem, there is usually a consensus amongst experts that one particular answer is better or more *ideal* than others. Hence, correct answers to our ill-defined problems were defined in terms of implementing a better or more *ideal* response strategy. We determined an *ideal* response strategy for each of our 50 scenarios using two alternative approaches.

First, we tried using solutions that were identified in the original sources of the scenarios. These solutions were coded for the leadership strategies they employed. The advantage of this method is that it provided a fully independent definition of the current response. The disadvantage is that the identified strategy may not be the best strategy for the given scenario because we had to modify many of the scenarios from their original sources: scenarios from the TKML: PLQ had to be modified to fit an open response format rather that a rating of fixed alternatives format; and scenarios from the ALTKC sometimes had to be adapted from a company level of leadership to a platoon level. Moreover, the solutions for the ALTKC were described as good solutions that were used rather than necessarily the best solutions. Thus these ideals are likely to be only approximately ideal.

Second, we used a more empirical approach to obtain a broad consensus across the experts (n=66) in Experiment 1. Consensus was defined as the most frequent (modal) choice across a group's individual members. Hence, an *ideal* response for each scenario was defined in terms of the experts' modal response strategy for that scenario. In the seven cases where the modal strategy was a tie we counted both strategy responses as an *ideal* (Note: including these seven less clear cases or not does not change the overall pattern of results obtained). The results of this procedure are presented later. While both approaches provided a valid set of responses, the modal strategy approach was adopted as a more precise measure.

We used these *ideals* to measure performance. If the ideals are based on some form of the expert group data, then it may be considered circular to examine whether the expert choices are more similar to the ideals than those of the other groups. This problem is a common Achilles heel of expert/novice studies. Nonetheless, we used the more precise consensual definition of ideal responses for the particular scenarios, in a domain already fraught with high noise and variability.

There are several factors that reduce the circularity issue. First, our two different methods of developing the ideals produced qualitatively similar results: group differences on our measures of strategy use showed the same patterns, although not always as strongly. Second, since there is variability in responses across the experts (experts' responses displayed a range of strategies), the distribution of ideals can be (and was) considerably different from the distribution of overall responses. In other words, the circularity is not necessarily very tight from one level of analysis to another. Third, if the circularity were empirically tight, one would expect clear expertise effects for all four components of the ASM, and this is not what we observed, as will become apparent. Fourth, we had three levels of expert groups. If the novices differ from the intermediates in the same ways as the intermediates differ from the experts, then the results are clearly not the result of a definitional circularity. For example, if intermediates are significantly better on the choice measure than novices, this result cannot be attributed to problems of using expert choices to define the correct answers.

<u>Procedure</u>

For non-experts, all experimental materials were presented in the lab via a world-wide-web browser on a computer networked to a web server. This server system automatically assigned identification numbers, presented the experimental instructions and measures, and collected the data. Expert participants lacked outside network access on the bases and received paper and pencil versions of the same tasks. All participants received as much time as necessary to complete the tasks.

At the start of the experiment, the researcher read general instructions for the experiment and answered participants' questions. Text-based instructions were also provided with the task, and researchers were present during the experiment to answer any additional questions that arose.

After answering a brief background survey on past leadership experiences, participants responded to 10 scenarios. The instructions asked participants to provide a detailed description of

how they would handle each given scenario and there were no limits on the length of their responses. The novice group (non-military undergraduates) was also told that they should request clarification from the researchers if they encountered any terms that were unfamiliar (which happened twice across the 39 novices). All participants were free to complete the problems at their own pace.

## Results And Discussion

The overall goal of Experiment 1 was to assess three of the four components of the Adaptive Strategies Model in an ill-defined domain – leadership. To review, the hypothesis is that experts' and non-experts' leadership performance, when characterized in terms of strategy use, will vary along four theoretical subcomponents of strategy usage. Experts should: know better strategies (*existence*), know which strategies are better solutions to different scenarios (*choice*), use the most frequently successful strategies more often (*base-rates*), and execute shared strategies more accurately (*execution*). Experiment 1 examined differences in strategy *existence*, *choice*, and *base-rate*; Experiment 2 examined strategy *execution*.

All four components of the ASM are also inter-related to some degree (for example, strategy *choice* is influenced by strategy *existence* and *base-rate*). Therefore, an additional focus of our analysis was to develop operational measures for each component that were as logically independent as possible. Hence, the more specific goals of experiment 1 were to: a) Reliably categorize leadership behavior in terms of *strategy use*; b) *Quantify* strategy use in terms of strategy *existence*, *choice*, and *base-rates*; and c) Examine group differences within each of these dimensions.

The primary source of data in Experiment 1 was participants' open-ended *responses* to *leadership scenarios*. Participants typically spent 3 to 5 minutes generating a response to each of 10 scenarios, and responses were approximately 80 words long on average. This response length proved to be enough elaboration to reliably code the free-text responses into distinct *leadership strategies*. This ability to reliably categorize participants' open-ended responses into distinct leadership strategies is an existence proof of the notion of strategy use in Army leadership.

<u>Data Coding</u>

Three raters categorized each response as an implementation of one of ten leadership strategies. The raters were given the list of ten strategies and their definitions, and the open-ended responses (randomized) with their corresponding scenario (for context). The raters were blind to the source of any individual response (novice, intermediate, or expert). If a rater felt that more than one strategy description could apply to a response, they identified which strategy was the most dominant.

The raters coded subsets of responses individually, then compared ratings, and after a lengthy training process obtained a reliability measure of 85% agreement, which is considered reasonable for this type of open-ended task and ill-structured domain. Having achieved an

acceptable level of reliability, the raters proceeded to code the remaining corpus of responses. All three raters coded the full corpus of responses, and all discrepancies were resolved through discussion. As noted earlier, this coding reliability convergence process was instrumental in producing the final strategy set that was coded.

Ideal Response Strategies

As described earlier, we computed, for each scenario, an *ideal* response strategy based on the modal strategy employed across all of the expert participants in Experiment 1 ($n$ = 66). When the modal strategy resulted in a tie between two strategies (7 scenarios), we counted both strategies as an *ideal* response.

Strategy Existence

The *existence* component of the ASM makes two basic predictions about experts' and non-experts' strategy use. First, both experts and non-experts will use multiple strategies across any given set of problems. Second, experts will also know some strategies that non-experts do not. If experts possess strategies that non-experts lack, then we should see this difference in the best strategies, those that were an *ideal* response across all 50 scenarios most frequently. Figure 1 shows a histogram of *ideal* strategy use across the 50 scenarios.

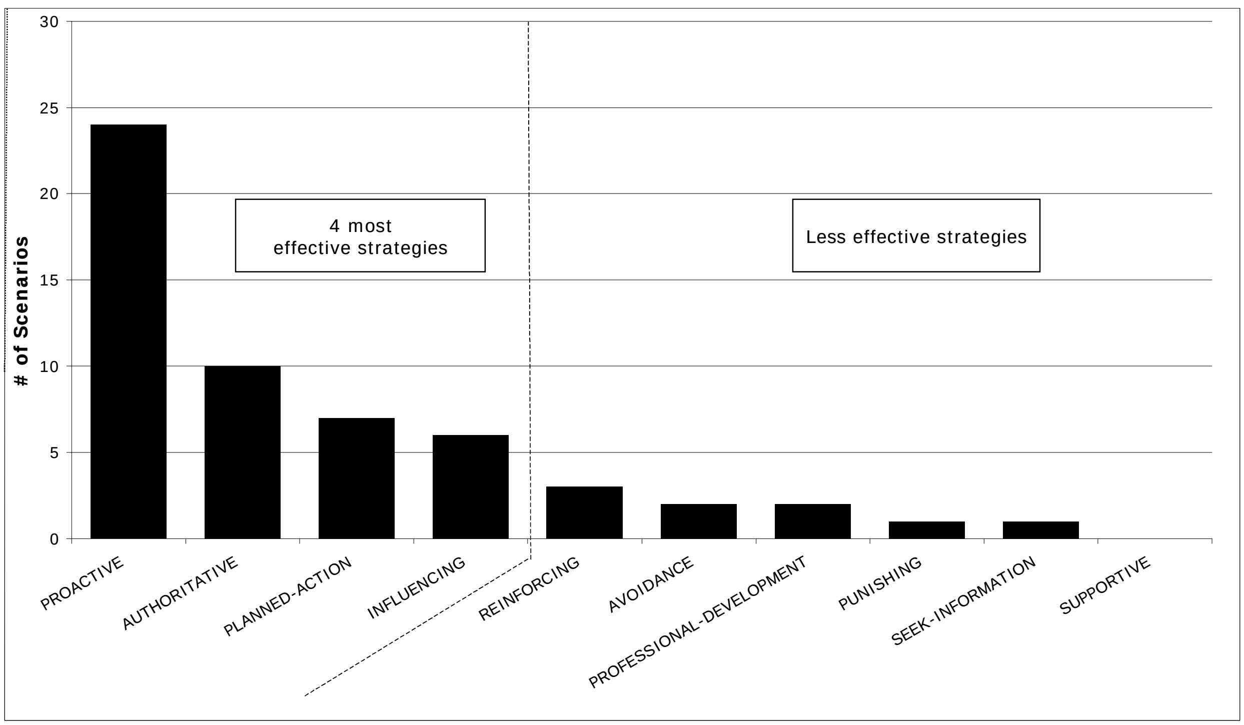


*Figure 1*. Number of Scenarios for which Each Strategy was Considered the Best or *Ideal* Response to the Scenario (across 50 scenarios).

The four most effective strategies were Proactive, Authoritative, Planned Action, and Influencing, respectively. The same four were the most frequent *ideal*s whether one looked at all

50 scenarios, or only the 25 scenarios on which experts had the highest level of agreement. Because the first four represent a natural breakpoint in the distribution shown in Figure 1, many of the later analyses focus on this set of four strategies. Strategies that occurred very infrequently simply do not involve sufficient responses for reliable analysis.

Strategy *existence* was then measured by examining three dimensions of individuals' pattern of strategy use across the ten scenarios that each participant responded to. First, we examined individuals' use of multiple response strategies in general. Second, we asked how many of the top four *ideal* strategies did each individual know? In other words, across a given set of scenarios, how many of the top four *ideal* strategies did each individual use at least once. Third, we calculated how often all four of the top strategies existed within each individual. The results of which are shown in Table 5.

| Strategy | Novice | Intermediate | Expert |
|---|---|---|---|
| 1. ProActive | 0.92 | 0.91 | 0.95 |
| 2. Planned-Action | 0.74 | 0.57 | 0.73 |
| 3. Authoritative | 0.79 | 0.78 | 0.82 |
| 4. Influencing | 0.85 | 0.83 | 0.58 |
| All Combined | 0.44 | 0.26 | 0.35 |

*Table 5.* Mean Existence of Top Four Ideal Strategies by Group

As predicted, all groups used (or demonstrated the existence of) multiple strategies across scenarios ($M$ = 5.4, 5.3, and 5.5, for novices, intermediates, and experts, respectively, *n.s.*). Moreover, in terms of the top four *ideal* strategies, there were no significant differences between the novices and intermediates. Although the Planned Action strategy appeared to exist less amongst intermediates than novices or experts, this difference is not statistically significant, and given that the intermediates were previously novices, it is unlikely that the intermediates truly lacked the Planned Action strategy altogether. Similarly, while the Influencing strategy was found to exist significantly less amongst the experts than in the novices or intermediates ($p < .01$ for both of these comparisons), the fact that the experts were previously novices and intermediates suggests that it is also unlikely that the experts lacked the Influencing strategy altogether. Thus, these top four strategies most likely existed in all three groups to an equal extent.

The fact that the novice, intermediate, and expert groups all demonstrated relatively equal existence of the Proactive, Planned Action, Authoritative, and Influencing strategies suggests that these particular strategies, as we defined them, may be general leadership strategies that most people acquire by adulthood. While the difference was not statistically significant, noticeably fewer of the intermediate group demonstrated existence of the Planned Action strategy than experts and novices. It is unlikely that intermediates lacked this strategy altogether. Instead, it is likely that as leadership skills develop, intermediates encounter difficulty in recognizing, attending to, and/or processing the relevant situational details of scenarios that require more complex planning and thus fail to implement, or may choose to avoid, the more complex and time consuming Planned Action strategy. This result may also be explained in terms of a difference in strategy choice, which we will describe in the next section. Similarly, the

fact that the experts demonstrated significantly less existence of the Influencing strategy than novices or intermediates does not necessarily imply that experts lacked this strategy altogether. Alternatively, it is likely evidence of a base-rate effect in the experts, which we will examine after discussing strategy choice. Importantly, the lack of group differences suggest strongly that our approach to defining correct or *ideal* responses for each strategy did not contain a strong empirical circularity – it was quite possible for many individual experts to deviate from modal responses to particular scenarios.

Strategy Choice

The *Choice* component of the ASM predicts that experts will choose strategies more appropriately than non-experts. There are two equally important components to this notion of appropriate choice. One is knowing when an existing strategy does NOT apply, which is as important as the other, traditional measure of choice performance - knowing when a strategy does apply. Strategy choice differences were measured by comparing mean appropriate choice accuracies, computed as follows.

For each of the top 4 strategies that an individual used at least once, we computed a vector of ones and zeros to represent each individual's pattern of strategy choices across the given 10 scenarios responded to (chosen=1, not-chosen=0). For example, for the Proactive strategy, Expert 1 might have been given the first 10 scenarios and used that strategy on the first, third, and eighth scenarios. This would produce a vector of [1,0,1,0,0,0,0,1,0,0]. We then correlated that vector with the analogous vector for the *ideal* pattern of choices for the same strategy on the given set of 10 scenarios (again 1 for ideal, 0 for not ideal). For example, this Expert 1 might have a correlation of r=.5 with ideal for the Proactive strategy. We repeated this process for each of the top 4 strategies for each participant, resulting in a measure of appropriate strategy choice (a set of individually-based correlations) while controlling for individual differences in strategy existence (which we did not find). We then examined group differences in appropriate choice accuracy by comparing mean group correlations on the use of the top four *ideal* strategies (Proactive, Authoritative, Planned Action, and Influencing). For example, Expert 1 might have had accuracy correlations of r=.5, .6, .4, and .35 for the four strategies respectively, producing an overall mean accuracy score for Expert 1 of r=.46.

We used the top four strategies not because they are better strategies per se, but because they were chosen often enough by most participants to reliably measure choice patterns. Each of the top four strategies was used on at least 10% of each group's responses, while the remaining six strategies were used 7% or less. Figure 2 shows the results of this analysis, the Mean Appropriate Choice Accuracy per Group.

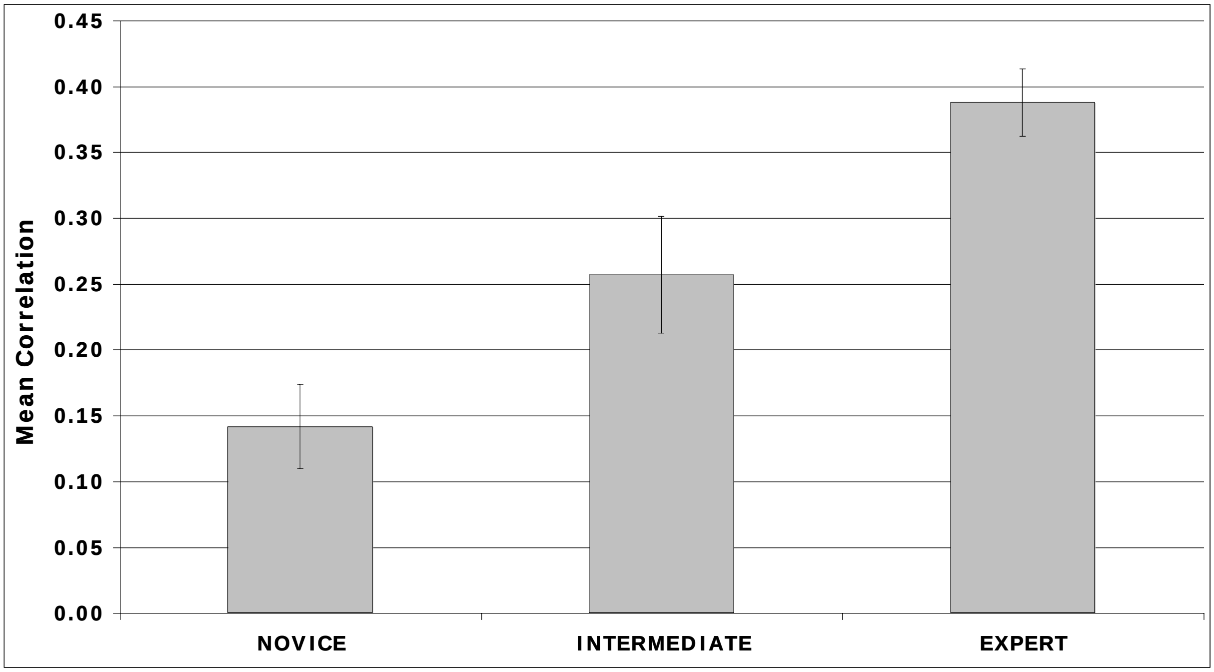


*Figure 2.* Mean Appropriate Choice Accuracy for the Top Four Ideal Strategies* (and standard error bars). *=The top 4 *ideal* strategies were 1) Proactive, 2) Authoritative, 3) Planned Action, and 4) Influencing.

As expected, we see a clear progression in individuals' abilities to make appropriate strategy choices as they gain experience. Intermediates (mean=.26, SD=.21) performed significantly better than novices (mean=.14, SD=.20), t (198) = 2.14, $p < 0.05$ (two-tailed); and experts (mean=.39, SD=.21) performed significantly better than intermediates, t (272) = 2.57, $p < 0.01$ (two-tailed). Experts also performed significantly better than novices, t (330) = 5.99, $p < 0.0001$ (two-tailed).

Strategy Base-Rate

The term *base-rate* is generally used to refer to the overall occurrence, or background prevalence of, events or category members within a given context (Hastie & Dawes, 2001). Within the current context of adaptive strategy use and military leadership, a given strategy's *base-rate* refers to the overall probability of it being an effective or *ideal* solution in general (i.e., across multiple scenarios). The ASM predicts that experts' strategy choices will be more sensitive to strategy *base-rates* than non-experts. In other words, experts' pattern of strategy use will be more consistent with the overall pattern of the probability of success per strategy than will non-experts' patterns of strategy use.

Each strategy's *base-rate* was computed by counting the number of times it was an *ideal* response across all 50 scenarios, which approximates the overall probability of the strategy being an effective solution to any platoon leadership scenario in general. Individuals' base-rate sensitivities were computed similarly for each strategy that an individual used once or more. For

each individual's set of existing strategies, we counted the number of times they used each strategy across the 10 scenarios responded to.

We expect that experts' overall strategy use should correspond more closely to the *ideal* ordering of strategy effectiveness than would novices' overall strategy use. In other words, the experts should use the most effective strategy most often, the 2$^{nd}$ most effective strategy 2$^{nd}$ most often, and so on; while novices should use strategies in a manner less consistent with the same *ideal* order of strategy effectiveness.

Base-rate sensitivity was thus measured in terms of the frequency-based order in which individuals used each strategy in comparison to the frequency-based order of *ideal* strategy use. The number of times each of the 4 most frequently used strategies was an *ideal* response can be read from Figure 1, but for convenience are listed in Table 6. Again, we focus on the top 4 strategies because they occurred often enough to be observed reliably in most participants.

| Strategy | # Times Ideal Response |
|---|---|
| 1. Proactive | 24 |
| 2. Authoritative | 10 |
| 3. Planned Action | 7 |
| 4. Influencing | 6 |

*Table 6.* Order of Use of the Most Effective Strategies (across all scenarios)

Each individual's base-rate sensitivity was measured by comparing their frequency of using the top four *ideal* strategies to the ideal frequency of use of the top four strategies, in terms of frequency-based rank order. We then compared groups in terms of the extent to which group members used strategies in correspondence to the *ideal* ordering of those strategies, which was based on each strategy's overall effectiveness in the environment. We expected that experts would be more sensitive to this ordering as a function of their increased experience with platoon leadership situations.

In conducting this analysis, we made one minor adjustment. The ordering was adjusted to account for two factors. First, the Planned Action and Influencing strategies were *ideal* strategies close to equally often (7 and 6 times, respectively). Second, the majority of participants used one but not both of these strategies. Hence, we defined the ordering in a manner that treated the use of the Planned Action and Influencing strategies as equal. The resulting order was thus defined as using the Proactive strategy more than the Authoritative strategy (1 > 2), and using the Authoritative strategy more than either the Planned Action (3) or the Influencing (4) strategy, [Proactive > Authoritative > (Planned Action OR Influencing)]. The results of this analysis are shown in *Figure 3*.

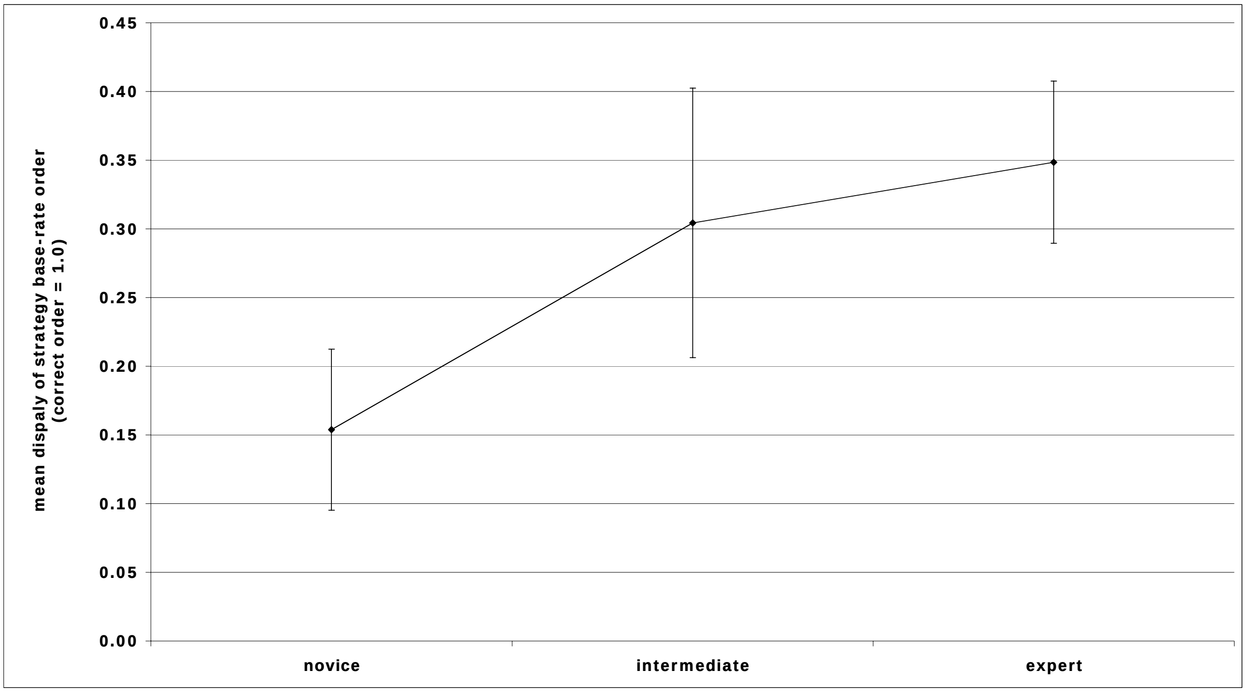


*Figure 3.* Base-Rate Sensitivity in Terms of Mean Display of Ideal Order* (with standard error bars). * = Ideal order: Proactive > Authoritative > (Planned Action OR Influencing*)*

The results of this analysis were in the direction of the ASM prediction. Experts (mean=.35, SD=.49) were significantly more sensitive to the ordering of individual strategy base-rates than novices (mean=.16, SD=.37), t (103) = 2.18, $p$ = 0.03 (two-tailed), the intermediates' (mean=.31, SD=.46) were marginally more sensitive to base-rate order than novices', t (60) = 1.41, $p$ < 0.16 (two-tailed), and there was no significant difference between intermediates and experts ($p$ = 0.7).

Increased experience seems to make experts and intermediates increasingly sensitive to individual strategies' base-rates of success in the environment. However, while it appears that this sensitivity may reach ceiling at the intermediate level, it is possible that the lack of intermediate-expert difference is the result of too few intermediate participants. Because there were differences between experts and intermediates on strategy choice, the lack of a difference on base-rate sensitivity should not be taken as evidence of little experience difference between the groups.

## Experiment 1 Summary

We have shown that the Adaptive Strategy Model (ASM) is able to discern a number of expert/novice differences in an ill-defined domain such as military leadership. In sum, it appears that individuals have at least four general leadership strategies by adulthood - experts and novices all demonstrated the *existence* of the Proactive, Authoritative, Planned Action, and Influencing strategies. However, intermediates seem to go through a "transitory phase" of

development where, for a period of time before becoming experts, they may fail to focus on the details required to implement the more complex Planned Action strategy.

We also found that experts are significantly more skilled in choosing amongst strategies, both in terms of *choice* as well as *base-rate* sensitivity. In terms of the appropriate *choice* of strategies, we saw a clear novice to intermediate to expert progression in individuals' ability to make increasingly optimal strategy choices as they gain experience. In terms of strategy *base-rates*, when choosing strategies, increased experience seems to make experts and intermediates increasingly sensitive to strategies' base-rates of success in the environment, although this sensitivity either reaches a ceiling at the intermediate level, or there were too few intermediate participants to reveal the effect.

Overall, our analyses suggest that ill-defined domains such as leadership can be unpacked in terms of strategy choice and base-rates. Experiment 2 was designed to test whether or not strategy *execution* was also an important factor.

## EXPERIMENT 2: TEST OF STRATEGY EXECUTION DIFFERENCES

The purpose of Experiment 2 was to examine expert-novice differences in strategy *Execution* – the ability to apply or implement a strategy in response to a particular scenario. The ASM predicts that experts will execute strategies more accurately than non-experts even when the same strategies are selected for the same scenarios. Execution accuracy was measured using a *ratings task* applied to scenarios and participant responses from Experiment 1. In particular, ratings were gathered from a new group of military experts (*n=26)* to assess the execution quality of responses produced by each of the three groups in Experiment 1. Differences in strategy *execution* were measured by comparing mean expert ratings of novice, intermediate, and expert responses.

Rather than having experts rate all the responses from Experiment 1, we had the experts rate a carefully selected subset of the total response set. The advantages of this approach are twofold. First, by having multiple raters rate a common set of items (which would not have been possible if different experts rated different items to cover the full set of responses), we could examine consistency of rating and deal with confused or sloppy raters. Second, we did not want to confound execution with strategy choice or strategy base-rates, so we needed to find cases in which different groups were using the same strategies, and thus only execution could differ.

### Method

<u>Participants</u>

26 US Army Lieutenants and Captains (mean age = 26.2 years, 20 males, 23 with Bachelors and 3 with Masters) from an Army base (different than the 2 bases used in Experiment 1) participated voluntarily. All participants had commanded a platoon in the last 5 years.

Materials

Strategy execution abilities were assessed using a ratings task. For each of the three most frequently *ideal* strategies from Experiment 1 (Proactive, Authoritative, and Planned Action), we randomly selected a set of responses from each group in Experiment 1 (3 strategies x 3 groups x 6 responses per strategy per group to produce 54 items total)[1]. Note that because we chose these responses from actual participant data, these responses were taken from a broad range of the scenarios. Each response was then combined with its corresponding scenario and strategy to produce ratings items. In order to gather ratings of responses independent of strategy choice, our Experiment 2 group of experts were told that these responses had been produced by getting ROTC cadets to give the best possible implementation of a given strategy to the given scenario. Thus, they were to judge the effectiveness of implementation, not the effectiveness of strategy choice.

The 54 items were divided into 2 versions of the task so that each participant evaluated 27 responses to keep the ratings task manageable. Each set of 27 consisted of three responses from each of all 3 groups (novice, intermediate, expert), for each of all three strategies (Proactive, Authoritative, Planned Action). Of course, to the participants, it looked like nine responses (all by ROTC cadets) for each of all three strategies. For the 3 responses for a given group for a given strategy in a given set of 27, the order of the 3 responses was held fixed as a block. But the order of these expertise group blocks for a given strategy was randomly ordered for each subject (e.g., one participant might have received expert, then novice, then intermediate responses for the proactive strategy whereas another participant might have received intermediate, then expert, then novice responses for that strategy). Responses were rated on a nine-point scale in terms of how accurately the given strategy was implemented in response to the given scenario.

Procedure

Participants were randomly assigned one of the two versions of the ratings task. Each version included overall text-based instructions that the researcher read out loud. The instructions emphasized that the task was to rate responses from real ROTC participants who were not allowed to choose which strategy to use in generating their response to the given scenario – hence we were asking for ratings of strategy *execution* not choice. Participants were given as much time as needed to complete the task. The researcher was present at all times to answer any questions. Participants typically completed the 27 items within 30 minutes, although some participants completed the task in over one hour.

## Results And Discussion

The goal of experiment 2 was to assess the fourth component of the ASM, strategy *execution*. Our new group of experts rated strategy *execution* evident in responses taken from each of the three groups in Experiment 1 (novice, intermediate, and expert).

A few of our participants, feeling some time pressure to get back to work and/or having little interest in participating in this kind of research, appeared not to be fully motivated to

participate. Also, as is always the case with Likert ratings tasks, some participants can confuse the direction of the ratings dimensions. To reduce the impact of low motivation or temporary confusion about the ratings dimensions, we examined the correlations of each participant's ratings with that of the group. We removed participants who were more than one standard deviation away from the mean correlation with average group judgments. This procedure removed 7 of the 26 participants from the remaining analysis.

Group differences in strategy *execution* ability were analyzed as follows. We combined the ratings data from our two versions of the ratings task – recall that the different versions were designed to be equivalent (response items were randomly assigned to version). Each group's (novice, intermediate, and expert) strategy *execution* ability was measured by computing the mean expert rating of responses taken from that group. Figure 4 shows these results.

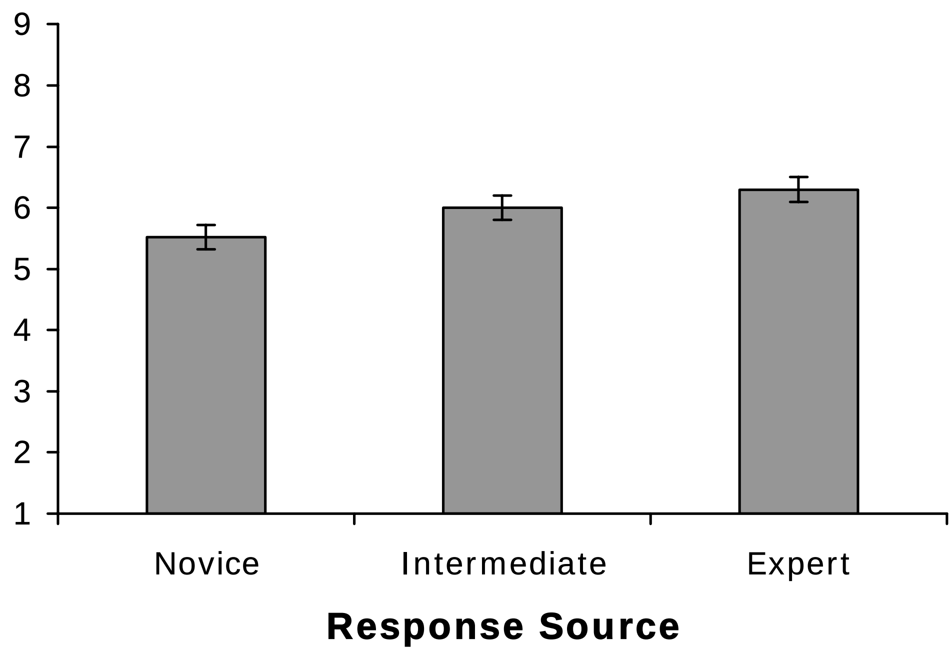


*Figure 4.* Mean Expert Ratings of Strategy *Execution* by Response Type (with within-subject Standard Error Bars)

Compared to novices, ratings of strategy *execution* were significantly higher for responses from experts, t (18) = 3.12, $p < 0.01$ (two-tailed); and intermediates, t (18) = 2.46, $p < 0.05$ (two-tailed). However, the difference in ratings of responses from experts versus intermediates was not statistically significant ( $p < .24$), although the trend is in the predicted direction. The results suggest that experts do execute strategies more accurately than non-experts, which support the ASM's original prediction, and shows that strategy execution is an important factor in ill-defined domains like leadership.

## General Discussion

Overall Findings

This research examined the development of strategy expertise in an ill-defined domain, leadership. Specifically, two experiments tested the ability of the Adaptive Strategies Model to describe expert/novice differences in responses to platoon leadership scenarios. The ASM predicted expert/novice differences within four components of strategy use: strategy existence, strategy choice, strategy base-rate, and strategy execution. The results support three of the ASM's four predictions: strategy choice, strategy base-rate, and strategy execution. The ASM showed that as leaders progress from novices to intermediates to experts, they develop a) the ability to make optimal choices about when and where to use particular strategies, b) an increased sensitivity to each different strategy's base-rate of success in the environment, and c) the ability to execute strategies more accurately.

Although all participants used multiple strategies (supporting one part of the strategy existence prediction), we found no increases in which strategies existed between groups, at least among the critical top four ideal strategies. The observed expert/novice differences in strategy existence amongst the top four strategies were in the wrong direction and suggest that potential expert/novice differences amongst strategies can be confounded with the effects of strategy choice and strategy base-rate.

It is interesting to note that Lemaire & Siegler (1995) also failed to find significant differences in strategy existence when they examined evidence of all four aspects of the ASM in a given domain. Thus, it may be that strategy existence differences come into play less often than the other factors of the ASM, or perhaps primarily at a very early stage of expertise. Even our novices had some experience with leadership more generally.

We do not wish to claim that strategy existence differences (typically referred to as the results of strategy discovery processes) are not part of expert/novice differences. In many settings , people learn new, more effective strategies (e.g., learning the min strategy in addition; Siegler & Jenkins, 1989).

Group Consistency Differences

One might ask how consistent were the responses within each of the groups? Was it the case that experts were simply more consistent with one another than were intermediates and intermediates were more consistent with one another than novices? If ones model was that expertise moved confusion towards a common understanding, then one would expect such a reduction in within-group variability in strategy choice. However, it could be that novices come to the task with a particular set of common (mis)conceptions, and that experience does not reduce variability, but rather shifts what the general conceptions are. Such a result would be consistent with Siegler's (1996) claim that strategy variability is prevalent throughout performance and is always adaptive.

One additional reason for examining this issue is that it might produce an alternative explanation for our group differences: if the increase in expertise had reduced within-group variability and we defined correct performance by expert performance, then one would expect increasing performance across our various strategy measures simply as a function of increased within-group consistency.

We examined the mean intercorrelations of strategy choices for each of the top four strategies (e.g., did each subject choose planned action on the same set of trials?). Specifically, the 1(yes), 0(no) vector of using a given strategy across each problem of one subject was correlated against that same vector for another subject, and this correlation was done for all pairs of subjects in a group, and a mean pairwise correlation was computed for each group for each of the top four strategies. We found no group differences in these within-group intercorrelations, overall, or, within each of the top four strategies. The mean within-group intercorrelations (across the top four strategies) were .23, .17, and .23 respectively for the novice, intermediate, and expert groups. (Note that this result is not inconsistent with choice accuracy results in Figure 2. Figure 2 showed that the <u>mean</u> of the distribution of responses moved closer to the ideal set with increasing expertise, while the intercorrelational analysis shows that the <u>variance</u> of the distribution remains as large across expertise.) Thus, the data is consistent with Siegler's claims of the continued presence of strategy variability, and does not support this alternative explanation of our groups' differences on the strategy use measures.

<u>Caveats</u>

There are a few other possible alternative explanations for our expert/novice differences in leadership. First, the 'Great-man' theory holds that leaders are born not made. If true, then while the ASM may find expertise differences, they will ultimately be insignificant in terms of training and development. However, the comprehensiveness of the army's training programs is based on strong evidence to the contrary (Bass, 1981). Yet, because of our cross-sectional design, it is still possible that our group differences are the result of genetic rather than learning differences.

Second, it may be the case that representational differences determine strategy use differences. However, if training is the goal then focusing on internal representations may be inefficient. The assessment of mental representations is difficult, especially in ill-structured domains and thus there is some question about how one would use mental representations to inform leadership training. Alternatively, it may be possible to strengthen or modify existing internal representations by focusing on the external output of the internal representation. In other words, internal representations produce leadership strategies, and by focusing on how these strategies are used it may be possible to strengthen or modify their underlying internal representation.

There are also three significant components of leadership expertise that were not addressed in this research. First, before any leadership action can be taken, a leader must recognize the need for it. Our scenarios presented situations as problems. Similarly, how an individual represents a problem situation will be an important determinant of how they solve it. We did not measure problem representation, at least not directly. Lastly, effective leadership requires the motivation to lead. While recognition, representation, and motivation are all likely to

be important components of leadership, they are separate loci of analysis and were thus not directly addressed in this research.

Experiment 2 was designed before the analysis of Experiment 1 was completed. At that point in time, we had (erroneously) thought that the top three strategies was the best break point. Also, as a pragmatic factor, using only the top three strategies made the ratings task easier to fit into a single session.

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## Appendix A:

## A Sample Scenario for Each Competency

Competency: Teaching and Counseling

*Scenario-1:* You are a platoon leader and you receive a new private. On his second day in your platoon, he says that he wants to kill himself. You refer the Soldier to the Medical Health Center and the chaplain. Soon after, you learn that the medical center has not assigned a person with relevant professional training to help the Soldier. The chaplain is not having much effect because the Soldier is not religious. In general, you have doubts about the qualifications of the people assigned to help him. You are very concerned about this situation. What should you do now?

Competency: Soldier/Team Development

*Scenario-12:* You are a platoon leader and one day your driver has a motivational problem while out in the field. He starts mouthing off to you while standing on top of the turret in front of the rest of the platoon. Everyone in the platoon is listening to what he's saying about you, and it is extremely negative and harsh. What should you do?

Competency: Supervision

*Scenario-22:* You are a new platoon leader. The battalion you support is preparing to conduct a night move. You assemble everyone to start packing equipment in preparation for the move that same night. When you come back to inspect their movement preparation, you find that your Soldiers have not packed the equipment and are talking to personnel from other platoons, who are hanging around the area. What should you do?

Competency: Communication

*Scenario-31:* You have spent two months working with your new battery commander. In his last position as the Fire Support Officer for an infantry battalion he supervised a shorthanded team. Consequently, he was required to perform many duties himself. Your commander still tries to stay involved in all of the day-to-day details of running the unit and he generally delegates tasks less often than you would like. You believe that your commander is overburdened, and you are worried about the consequences of his time-management techniques. What should you do?

Competency: Planning

*Scenario-39:* You are a platoon leader and your battalion requires the company to turn in training schedules six weeks in advance. But the battalion doesn't give you six weeks notice on requirements. Thus there are a lot of changes to the training schedule. The battalion tells you six weeks out is too far in the future to assign projects yet they expect you to plan training six weeks out. The Soldiers think that these changes in the schedule jerk them around and sometimes cause morale problems. What should you do?

Competency: Decision-making

*Scenario-43:* During the live fire attack at the National Training Center, your tank platoon is in an overwatch position as part of an observation post (OP). You are supposed to wait to be called forward into the attack. From your position, you watch artillery come in on the enemy positions. The smoke from the artillery obscures the enemy's view. At this point, you should move out – you should call your commanding officer and tell him you are moving while the enemy is blinded. Instead you wait to be told to move out, as called for in the OP plan. Consequently, you move after the smoke lifts, and you lose three tanks, including your own. You are angry with yourself and ashamed; you believe you should have known better. How should you deal with this situation?

Competency: Use of Available Systems

*Scenario-47:* You are a new platoon leader and are under a great deal of stress. Everyone is expecting a lot of you, and there never seem to be enough hours in the day to accomplish everything. There is a lot of competition for awards and career enhancing positions in the future, and other officers are working as hard as you are. At home your family also needs your time and attention. How should you manage your stress?

## Appendix B

### Definitions of the 10 Leadership Strategies

**Avoidance** – The leader takes no immediate action to deal with a situation that is clearly his or her responsibility, assuming that if left alone, the situation will resolve itself.

**Authoritarian** – The leader immediately takes charge of situation, asserts his/her position, gives direct orders/commands without adequate reason for adopting course of action, seems to be based on instinct/gut feel. Leader may also simply adopt regulations and pass down orders.

- Examples include
    - ordering the Soldiers to do a task,
    - taking charge of a situation, with no rationale other than "because I say so."
    - Also includes citing field manuals as rationale and
    - using a commanding officer's order as rationale for a decision.

**Influencing** – The leader convinces or persuades others to his point of view.

- Examples include
    - discussing issues with the leader's commanding officer so that he/she sees individual's point of view;
    - convince other respected members of the platoon of the leader position.

**Planned-Action** – The leader carefully and deliberately plans the steps taken to execute course of action, considers options and consequences. Thus actions tend to be procedural in nature, underscoring the leader's rational thought process.

- Examples include
    - methodically planning training sessions to achieve a goal;
    - carefully reviewing all aspects of a situation before making a decision.

**Proactive** – The leader does not wait to be told what to do, anticipates what needs to be done, and does it.

- Examples include
    - offering to take care of specific tasks for the leader's commanding officer before he/she asks,
    - telling Soldiers what to expect so they can plan ahead.

**Professional development** – The leader focuses on the professional development of his/her Soldiers as individuals and as part of the platoon, actively works to build credibility with Soldiers and develop Soldiers into a cohesive unit. Encompasses working one-on-one with a Soldier to aid his/her development, providing appropriate training/development activities for each member of the unit. In addition, the leader maintains personal control, military bearing and works on areas of personal development and self-management. Overall, the leader looks at feedback as a method of improving performance. The leader follows through on what he/she says he/she will do and listens frequently to Soldiers' opinions and suggestions, particularly in areas outside the platoon leader's expertise.

- Examples include
    - maintaining respect for self and others,
    - practicing techniques to control inappropriate emotional responses (yelling),
    - reminding self of short and long-term goals.

**Punishing** – The leader threatens Soldiers with punitive actions as an immediate response to a situation.

- Examples include
    - chewing someone out,
    - yelling at solders,
    - threatening with discharge or other punishment.

**Reinforcement** – The leader actively seeks out opinions and advice of key individuals, either inside or outside of his/her direct chain of command, including superior officers, key subordinates, other platoon leaders and non-military individuals.

- Examples include
    - using fellow platoon leaders as a feedback group,
    - using competent officers as mentors and sources of advice,
    - asking the company commander for advice on handling a situation,
    - working through the NCO chain of command to resolve a situation.

**Supportive** – The leader seeks to see things from his/her Soldiers' perspective, has empathy for Soldiers' situation, ensures that Soldiers receive appropriate rewards and recognition, stands up for Soldiers when necessary.

- Examples include
    - arranging for better assignments after difficult ones have been completed,
    - recognizing when the leader's Soldiers have reached their limits and doing something about it.

**Seek additional information** – The leader seeks additional information about the current situation.

- Examples include
    - querying platoon sergeant or Soldiers involved in the situation for more information,
    - confirming the current status and looking for underlying causes.

## Footnotes

Experiment 2 was designed before the analysis of Experiment 1 was completed. At that point in time, we had (erroneously) thought that the top three strategies was the best break point. Also, as a pragmatic factor, using only the top three strategies made the ratings task easier to fit into a single session.